RECEIVED
CENTRAL FAX CENTER
MAY 27 2008

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 16, and 17 as follows:

1. (Currently Amended) A method of controlling a conductivity of a Ga_2O_3 system single crystal, comprising:

adding a predetermined dopant to the Ga_2O_3 system single crystal such that said dopant is substituted for Ga in the Ga_2O_3 system single crystal to obtain a desired conductivity ~~resistivity~~,

wherein said predetermined dopant comprises one of:

~~a~~ an n-type dopant for ~~decreasing a resistance~~ controlling a conductivity of the Ga_2O_3 system single crystal comprising one of Si, Hf, Ge, Sn, and Ti, said conductivity of the Ga_2O_3 system single crystal being controlled dependently on an adding amount of said n-type dopant; and

a p-type dopant for ~~increasing a resistance~~ controlling said conductivity of the Ga_2O_3 system single crystal comprising one of H, Li, Na, K, Rb, Cs, Fr, Be, Ca, Sr, Ba, Ra, Mn, Fe, Co, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, Tl, and Pb, said conductivity of the Ga_2O_3 system single crystal being controlled dependently on an adding amount of said p-type dopant.

2. – 3. (Canceled).

4. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 1, wherein a value of 2.0×10^{-3} to 8.0×10^{2} Ωcm is obtained as the desired resistivity by adding a predetermined amount of said n-type dopant.

5. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 4, wherein a carrier concentration of the Ga_2O_3 system single crystal is controlled to fall within a range of 5.5×10^{15} to $2.0 \times 10^{19}/cm^3$ as a range of the desired resistivity.

6. – 7. (Cancelled).

8. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 1, wherein 1 X 10^3 Ωcm or more is obtained as the desired resistivity by adding a predetermined amount of said p-type dopant.

9. (Withdrawn) A method of forming a Ga_2O_3 system single crystal layer, comprising:

heating contacting portions of β-Ga_2O_3 seed crystal and a high purity β-Ga_2O_3 polycrystalline raw material, said β-Ga_2O_3 polycrystalline raw material comprising one of a p-type dopant and an n-type dopant.

10. (Withdrawn) The method of forming a Ga_2O_3 system single crystal layer according to claim 9, wherein said n-type dopant comprises one of Si, Hf, Ge, Sn, and Ti; and

wherein said p-type dopant comprises one of H, Li, Na, K, Rb, Cs, Fr, Be, Ca, Sr, Ba, Ra, Mn, Fe, Co, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, Tl, and Rb.

11. (Withdrawn) The method of forming a Ga_2O_3 system single crystal layer according to claim 9, wherein said p-type dopant comprises no less than 0.01 mol% and no more than 0.05 mol%.

12. (Withdrawn) The method of forming a Ga_2O_3 system single crystal layer according to claim 11, wherein a resistance value of said layer is greater than or equal to 1000 MΩ.

13. (Withdrawn) The method of forming a Ga_2O_3 system single crystal layer according to claim 9, wherein said layer comprises a resistivity of no less than 2.0×10^{-3} Ωcm and no more than 8×10^{2} Ωcm; and

wherein a carrier concentration of said layer comprises no less than 5.0×10^{15} / cm^3 and no more than 2.0×10^{19} / cm^3.

14. (Withdrawn) A light emitting element, comprising:

an n-type β-$AlGaO_3$ cladding layer, an active layer, a p-type β-$AlGaO_3$ cladding layer, and a p-type β-Ga_2O_3 contact layer respectively laminated in order on an n-type β-Ga_2O_3 contact layer, said n-type β-Ga_2O_3 contact layer made of a β-Ga_2O_3 single crystal;

a transparent electrode and a pad electrode respectively formed in order on said p-type β-Ga_2O_3 contact layer; and

an n-side electrode formed over a lower surface of said n-type β-Ga_2O_3 contact layer,

wherein a desired resistivity of said β-Ga_2O_3 single crystal is obtained,

wherein said n-type layers comprise a dopant including one of Si, Hf, Ge, Sn, and Ti, and

wherein said p-type layers comprise a dopant including one of H, Li, Na, K, Rb, Cs, Fr, Be, Ca, Sr, Ba, Ra, Mn, Fe, Co, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, Tl, and Rb.

15. (Withdrawn) The light emitting element of claim 14, wherein a carrier concentration of said p-type β-Ga_2O_3 contact layer is greater than that of said p-type β-$AlGaO_3$ cladding layer; and

wherein a carrier concentration of said n-type β-Ga_2O_3 contact layer is greater than that of said n-type β-$AlGaO_3$ cladding layer.

16. (Currently Amended) A method of controlling a conductivity of a Ga_2O_3 system single crystal, comprising:

adding a predetermined dopant to the Ga_2O_3 system single crystal such that said dopant is substituted for Ga in the Ga_2O_3 system single crystal to obtain a desired conductivity ~~resistivity~~,

wherein said predetermined dopant comprises a p-type dopant for controlling a conductivity ~~increasing a resistance~~ of the Ga_2O_3 system single crystal, said p-type dopant comprising one of H, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Mn, Fe, Co, Ni, Pd, Cu, Ag, Au, Zn, Cd, Hg, Tl, and Pb, said conductivity of the Ga_2O_3 system single crystal being controlled dependently on an adding amount of said p-type dopant.

17. (Currently Amended) The method of controlling said conductivity of said Ga_2O_3 system single crystal according to claim 16, wherein the predetermined dopant comprises one of:

said p-type dopant; and

an n-type dopant for controlling said conductivity ~~decreasing said resistance~~ of the Ga_2O_3 system single crystal.

18. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 17, wherein said n-type dopant comprises one of Si, Hf, Ge, Sn, Ti, and Zr.

19. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 17, wherein a value of 2.0×10^{-3} to 8.0×10^{2} Ωcm is obtained as the desired resistivity by adding a predetermined amount of said n-type dopant.

20. (Previously Presented) The method of forming a Ga_2O_3 system single crystal layer according to claim 19, wherein a carrier concentration of the Ga_2O_3 system single crystal is controlled to fall within a range of 5.5×10^{15} to $2.0 \times 10^{19}/cm^3$ as a range of said resistivity.

21. (Previously Presented) The method of controlling a conductivity of a Ga_2O_3 system single crystal according to claim 16, wherein 1×10^3 Ωcm or more is obtained as the desired resistivity by adding a predetermined amount of said p-type dopant.